CLAIMS

1. An optical control comprising:
one or more light sources; and
one or more reflectors arranged to reflect light from the light source or sources to redirect that light and concentrate that light towards one or more locations.

2. The optical control of claim 1, further comprising one or more light detectors.

3. The optical control of claim 1 or 2, further comprising light transmitting means that can transmit the optical output of the control to a light detector or detectors that is or are spaced apart from the optical control.

4. An optical control, wherein the control provides an optical output indicative of the state or position of the control, and wherein the optical output can be transmitted by light transmitting means to another remote component for subsequent processing.

5. The optical control of claim 3 or 4, wherein the light transmitting means comprise optical fibres.

6. The optical control of claim 3, 4 or 5, wherein the light transmitting means act to redirect the light from the optical control or controls such that it will propagate in free air towards a remote component or light detector or detectors.

7. The optical control of claim 6, wherein the light transmitting means comprise short lengths of light transmissive material that can accept light from the optical control at one end and emit it at their other

end and are shaped so as to be able to redirect the light towards a remote component or detector or detectors.

8. The optical control of claim 6 or 7, wherein the light transmitting means are arranged so as to be able to conduct the optical output of the control under a substrate upon which the control is to be mounted and then direct it towards a remote component or detector or detectors.

9. The optical control of claim 6, 7, or 8, wherein the control has plural optical outputs, and further comprises a number of light transmitting means corresponding to its number of optical outputs, each light transmitting means being arranged to redirect the light from a different output to propagate in free air in a direction that is different to the propagation directions of the remaining light transmitting means.

10. The optical control of any one of the preceding claims, wherein the reflector or reflectors that concentrate the light from the light source or sources towards one or more locations have a substantially parabolic shape.

11. The optical control of any one of the preceding claims, wherein the light is concentrated towards one or more light detectors or light transmitting means.

12. The optical control of any one of the preceding claims, wherein the reflector or reflectors are arranged to reflect light from a single light source towards plural different locations.

13. The optical control of any one of the preceding claims, wherein the or a reflector or reflectors of the

optical control acts or act to concentrate the light from a light source towards more than one location.

14. An optical control comprising:
one or more light sources;
means for splitting the light from a single light source into plural different paths, whereby light from one light source can be directed at plural different light detectors.

15. An optical control comprising:
one or more light sources;
a plurality of light detectors;
wherein light from one light source is directed at two or more of the light detectors.

16. The optical control of any one of the preceding claims, comprising first and second reflective surfaces arranged such that the first reflective surface diverts light from a light source toward the second reflective surface which then directs and concentrates the light towards one or more locations.

17. The optical control of any one of the preceding claims, wherein the or a reflector or reflectors is arranged to redirect the light such that it generally returns towards the light source.

18. An optical control comprising one or more light sources and one or more light directing means arranged to redirect and concentrate the light from the light source or sources such that it is concentrated in a direction back towards the light source or sources but laterally spaced therefrom.

19. The optical control of claim 17 or 18, further comprising one or more light detectors or one or more

light transmitting means, and wherein the light sources and light detectors or light transmitting means are arranged on the same surface.

20. An optical control comprising one or more light sources and one or more light detectors, wherein the light sources and light detectors are arranged on the same surface.

21. The optical control of any one of the preceding claims, further comprising a cover element having apertures in it arranged in the path of the concentrated light beam or beams from the reflector or reflectors.

22. An optical control comprising:
one or more light sources;
a cover element formed with one or more apertures;
wherein the cover element is arranged such that light from a light source passes through an aperture in the cover element.

23. The optical control of claim 21 or 22, further comprising one or more light detectors, and wherein the cover element is arranged over the light detectors with its apertures positioned such that light from a light source must pass through an aperture in the cover element to reach the light detectors.

24. The optical control of any one of the preceding claims, further comprising a housing that can carry and cover one or more of the components of the control.

25. The optical control of claim 24, wherein the housing is arranged to cover the optical control and to extend a uniform height above a substrate on which the control and housing is to be mounted.

26. The optical control of any one of the preceding claims, wherein the optical control uses an absolute digital encoding scheme to provide an output indicative of its position, and wherein the number of positions to be indicated by the control is set to be less than the maximum number of positions that could be encoded given the available outputs of the control that can be detected.

27. An optical control that uses a digital absolute position encoding scheme, comprising:

a shutter member carrying one or more adjacent optical encoding tracks; wherein:

the control is arranged such that the number of discrete control positions indicated by the optical control is less than the maximum number of discrete positions that could be indicated by the number of encoding tracks provided on the shutter.

28. The optical control of claim 26 or 27, wherein the control comprises one more encoding track than the minimum number of encoding tracks required to indicate the desired number of control positions.

29. The optical control of any one of the preceding claims, wherein the control uses an absolute encoding scheme to provide an output indicative of its current position, and wherein the end positions of the control are represented by coding states in which at least one output of the control is in one state and some or all of the remaining outputs of the control are in a different state.

30. An optical control that provides plural optical outputs that can be read to indicate the position of the control, wherein the control is arranged such that at least one optical output of the control is in a

different state to other optical outputs of the control at each end position of the control.

31. An optical control that provides plural optical outputs that can be read to indicate the position of the control, wherein the control is arranged such that a control state in which all the optical outputs of the control are in the same state is not used to indicate an end position of the control.

32. The optical control of claim 29, 30 or 31, wherein the control is arranged such that an outer output of the control is in a state opposite to the remaining outputs of the control at the end positions of the control.

33. The optical control of any one of the preceding claims, wherein the optical control provides plural optical outputs that can be read to indicate the position of the control and wherein all the positions of the control that it is desired to indicate are indicated by output states in which at least two outputs of the control are in different states to each other.

34. The optical control of any one of the preceding claims, wherein the optical control provides plural optical outputs that can be read to indicate the position of the control and wherein there is no control position that is indicated by all the control outputs being in the same state.

35. An optical control that provides plural optical outputs that can be read to indicate the position of the control, wherein the control is arranged such that at least one optical output of the control is in a different state to another optical output of the control for each position of the control that it is desired to indicate.

36. An optical control that provides plural optical outputs that can be read to indicate the position of the control, wherein the control is arranged such that a control state in which all the optical outputs of the control are in the same state is not used to indicate a position of the control.

37. The optical control of any one of the preceding claims, wherein the encoding patterns for the end positions of the optical control are extended such that they are provided over a range of movement of the optical control that is greater than the range of movement over which encoding patterns for other positions of the optical control are provided.

38. An optical control in which discrete output patterns of the control provide an indication of the control's position or state, wherein: the output patterns for indicating a or each end position of the control's range of travel extend for a greater range of movement of the control than an or each output pattern for indicating a non-end position of the control.

39. The optical control of any one of the preceding claims, wherein the control provides at least two spaced-apart rows of optical outputs that can be read to indicate the position of the control, and wherein the control is arranged such that the output of one of the two or more spaced apart rows of optical outputs can be used to determine that another row of optical outputs should be used to determine the position of the control.

40. The optical control of any one of the preceding claims, wherein the control provides at least two spaced-apart rows of optical outputs that can be read to indicate the position of the control, and wherein the control is arranged such that the output of one of the

two or more spaced apart rows of optical outputs can be used to determine that the row of optical outputs to be used to determine the position of the control should change.

41. An optical control which provides at least two spaced-apart rows of optical outputs that can be used to determine the position of the control, wherein the control is arranged such that the output of one of the two or more spaced apart rows of optical outputs can be used to determine that another row of optical outputs should be used to determine the position of the control.

42. An optical control which provides at least two spaced-apart rows of optical outputs that can be used to determine the position of the control, wherein the control is arranged such that the output of one of the two or more spaced apart rows of optical outputs can be used to determine that the row of optical outputs to be used to determine the position of the control should change.

43. The optical control of claim 39, 40, 41 or 42, wherein the output of the one row of optical outputs that indicates that another row of optical outputs should be used to determine the position of the control or that indicates that the row of optical outputs to be used to determine the position of the control should be changed comprises the one row of optical outputs being in a predetermined state.

44. The optical control of any one of the preceding claims, wherein the optical control uses an analogue encoding scheme to provide an output indicative of its position, and wherein a or each analogue encoding track has an encoding region arranged such that as the control is moved unidirectionally along its range of travel, the

light output for that encoding track progressively decreases to a minimum and then progressively increases again, or vice-versa.

45. An optical control comprising an encoding track that is arranged to provide an analogue output signal indicative of the position of the control, wherein the encoding track is arranged such that as the control is moved unidirectionally along its range of travel, the analogue output signal changes progressively from a minimum value to a maximum value and then returns progressively to the minimum value, or vice-versa.

46. The optical control of any one of the preceding claims, wherein the optical control uses an analogue encoding scheme to provide an optical output indicative of its position, and wherein the control comprises plural analogue encoding tracks.

47. An optical control that uses an analogue encoding scheme to provide an optical output indicative of its position, wherein the control comprises plural analogue encoding tracks.

48. The optical control of any one of the preceding claims, wherein the optical control uses an analogue encoding scheme to provide an optical output indicative of its position, and wherein the control provides plural spaced-apart optical outputs that can be read to determine the control's position.

49. An optical control that uses an analogue encoding scheme to provide an optical output indicative of its position, wherein the control provides plural optical outputs that can be read to determine the control's position.

50. An optical control system comprising a plurality of optical controls, wherein the optical controls each provide an optical output indicative of the state of the control; the system further comprising light transmitting means to transmit the optical outputs of the controls to a processing unit capable of reading the optical data generated by the controls.

51. The optical control system of claim 50, further comprising a common detector or set of detectors that is shared by plural optical controls.

52. An optical control system, comprising: a plurality of optical controls mounted on a substrate, each optical control comprising one or more light redirecting means for directing its optical output to travel through free space to a remote detector or detectors that is or are common to the plurality of optical controls.

53. The optical control system of claim 51 or 52, wherein the equivalent or corresponding outputs of each optical control are transmitted to the same detector.

54. The optical control system of claim 51, 52 or 53, wherein the detectors are mounted so as to be outside of and surrounding the optical controls that they service.

55. The optical control system of claim 50, 51, 52, 53 or 54, further comprising means for polling each control in turn to read its output.

56. The optical control system of any one of claims 50 to 55, comprising one or more optical controls in accordance with any one of claims 1 to 49.

57. A control panel comprising a control panel printed circuit board and one or more optical controls, the

optical controls including light sources and light detectors, and light sources and light detectors of the controls being mounted directly on the control panel printed circuit board.

58. The control panel of claim 57, comprising one or more optical controls in accordance with any one of claims 1 to 49.

59. A method of constructing an optical control or controls, comprising mounting the light sources and light detectors of one or more optical controls on a printed circuit board, and attaching a housing and/or other mechanical components of the control or controls to the printed circuit board.

60. The method of claim 59, comprising mounting one or more optical controls in accordance with any one of claims 1 to 49 on the printed circuit board.

61. A method of constructing an optical control that uses a digital absolute position encoding scheme, comprising:

determining the number of discrete positions that it is desired for the control to be able to indicate; and

providing an optical shutter member carrying optical encoding tracks that could be used to encode more discrete positions of the control than the determined number of discrete positions.

62. A method of reading the output of an optical control that provides at least two spaced-apart rows of optical outputs that can be used to determine the position of the control, comprising:

determining the position of the control from the output state of one of the rows of optical outputs until

that row of optical outputs enters a particular state or states, and then determining the position of the control from a different row of optical outputs.

63. A kit for an optical control, comprising:

a housing;

a movable control member mounted or mountable in the housing; and

one or more reflectors for location in the housing.

64. A kit of parts for constructing an optical control in accordance with any one of claims 1 to 49.

65. An optical control substantially as hereinbefore described with reference to any one of the accompanying drawings.

66. An optical control system substantially as hereinbefore described with reference to any one of the accompanying drawings.

67. A method of constructing an optical control substantially as hereinbefore described with reference to any one of the accompanying drawings.

68. A kit for an optical control substantially as hereinbefore described with reference to any one of the accompanying drawings.